COURSE DESCRIPTION

COURSE DETAILS

Title (of the course): **WILDLIFE MANAGEMENT AND CONSERVATION**
Code: 101097
Degree/Master: **GRADO DE INGENIERÍA FORESTAL**   Year: 4
Name of the module to which it belongs: OPTATIVIDAD
Field: OPTATIVIDAD
Character: OPTATIVA   Duration: SECOND TERM
ECTS Credits: 4.5   Classroom hours: 45
Face-to-face classroom percentage: 40.0%   Study hours: 67.5
Online platform: http://moodle.uco.es/m1920/course/view.php?id=601

LECTURER INFORMATION

Name: CUADROS TAVIRA, SIMON (Coordinador)
Department: INGENIERÍA FORESTAL
Area: INGENIERÍA AGROFORESTAL
Office location: LV4B090
E-Mail: mc1cutas@uco.es / scuadros@uco.es   Phone: 618862195

Name: ZAMORA DIAZ, RICARDO
Department: INGENIERÍA FORESTAL
Area: INGENIERÍA AGROFORESTAL
Office location: LV4B100
E-Mail: ig1zadir@uco.es   Phone: 957218656

PREREQUISITES AND RECOMMENDATIONS

Prerequisites established in the study plan

No prerequisites required.

Recommendations

Subject Ecología y Fauna Forestal taken and passed.

INTENDED LEARNING OUTCOMES

CB1	Knowledge of raw, scientific and tecnological materials which allow constant learning, as well as an capacity to adapt to new situations and changing surroundings.
CB2	Capacity to resolve problems with creativity, initiative, methodology and critical reasoning.
CB4	Capacity to search for the norms and regulations relevant to one´s present environment and put them into use.
CEC2	Capacity to learn, understand and utilise principles of: Zoology and Entomological Forestry.

OBJECTIVES

Comprehension of bases and methods to estimate population size of vertebrate wild animals and principles on wildlife management for conservation and recovery of endangered species.
Comprehension of the main features concerning wildlife management such as: population dynamics, habitat, diseases, genetics, carrying capacity and interactions among those factors. Description of some endangered species as well as actions and strategies to be implemented to recover endangered wildlife populations.

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COURSE DESCRIPTION

CONTENT

1. Theory contents

Part One. ESTIMATING POPULATION SIZE IN VERTEBRATES

Theme 1. SPATIAL AND TEMPORAL DISTRIBUTION OF ANIMAL POPULATIONS

The concept of animal population

Spatial patterns of animal populations

   Spatial distribution analysis

Temporal distribution of vertebrate populations.

Theme 2. COMPLETE CENSUS OR TOTAL COUNTS

Total counts of social units

Census of breeding colonies

Census of post-breeding gathering

Others total counts methods:

   Complete removal

   Thermal scanners.

Theme 3. DISTANCE METHODS

Itineraries of census

Itineraries based on elements interception

   Hayne estimator and variants

Itineraries based on contacts distribution

   Line transect

   Finnish transect

   Emlen method

   Crain et al. method

Bird census stations (variable circular plots)

   Järvinen method

   Emlen method.

Theme 4. CAPTURE CONTROL METHODS

   Change in ratio or Kelker method

   Index-removal or Eberhardt method

   Catch-effort methods

Theme 5. CAPTURE, MARKING AND RECAPTURE METHODS

Capture and branding

Closed populations

   One mark, one recapture

      Petersen estimator

      Chapman estimator

      Bailey estimator

      Sample size and confidence interval calculation

   Several marks and recaptures

      Schnabel weighted mean

      Nonweighted mean

Open populations

   Triple capture

   Jolly-Seber method.

Theme 6. ABUNDANCE INDICES

Direct count

Captures

Tracks and traces

Frequency.

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Theme 7. BIODIVERSITY INDICES
Definitions and calculation
Part Two. CONCEPTS AND TOOLS FOR WILDLIFE MANAGEMENT
Theme 8. POPULATION DYNAMICS AND MAIN INTERACTIONS
Definitions
Models for population dynamics
Main inter and intra specific interactions.
Theme 9. HABITAT AND WILDLIFE MANAGEMENT
Definitions. Use and selection of habitat
Habitat structure and components (food and shelter requirements)
Home range. Habitat improvement actions.
Theme 10. CARRYING CAPACITY
Definition
Methods to assess carrying capacity.
Theme 11. FEATURES CONCERNING WILDLIFE MANAGEMENT
Food selection. Overgrazing problems
Genetics: basic concepts and wildlife management implications
Wildlife diseases: Prevention and therapy strategies.
Theme 12. DESCRIPTION OF SOME ENDANGERED WILDLIFE SPECIES
Morphological, habitat, food, distribution features
Problems associated with species conservation.
Theme 13. WILDLIFE RECOVERY STRATEGIES
Legal, national and international protection rules
Different status of protection
Multispecific strategies: flagship, key species. Wildlife corridors
Monospecific and/or selected species strategies: Recovery plans for a single or a group of species.

2. Practical contents
Classroom exercises, presentations and case studies.
Visit to natural areas and/or wildlife rescue and recovery facilities.

METHODOLOGY

General clarifications on the methodology (optional)
Students will have all the class materials in English and Spanish

Methodological adaptations for part-time students and students with disabilities and special educational needs
Individual final examination

Face-to-face activities

Activity	Large group	Total
Assessment activities	2	2
Case study	9	9
Excursions	7	7

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Activity	Large group	Total
Lectures	27	27
Total hours:	*45*	*45*

Off-site activities

Activity	Total
Exercises	12.5
Information search	10
Reference search	5
Self-study	40
Total hours	*67.5*

WORK MATERIALS FOR STUDENTS

Case studies
Dossier
Exercises and activities
Oral presentations
References

Clarifications

All working materials available at Amoodle platform

EVALUATION

Intended learnig	Exams	Log	Oral Presentation	Problem solving
CB1	X			
CB2				X
CB4			X	
CEC2	X	X		X
Total (100%)	*50%*	*10%*	*20%*	*20%*
Minimum grade	*5*	*7*	*5*	*5*

(*)Minimum grade necessary to pass the course

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Method of assessment of attendance:

10% of the final mark, provided attendance is over 70% of the time, including the field trip.

General clarifications on instruments for evaluation:

Attendance sheets referred to classroom and outdoor visit.

Clarifications on the methodology for part-time students and students with disabilities and special educational needs:

Mark over 5 in Final exam

Qualifying criteria for obtaining honors:

Marks rating over 9 in all the evaluation items

BIBLIOGRAPHY

1. Basic Bibliography

Bookhout, T. A. (ed.). 1996. Research and management techniques for wildlife and habitats. Fifth ed., rev. The Wildlife Society, Bethesda, Md, 740 pp.

Buckland, S.T., D.R. Anderson, K.P. Burnham, and J.L. Laake. 1993. Distance sampling: estimating abundance of biological populations. Chapman and Hall, New York, N.Y. 446 pp.

McComb, B.C. 2008. Wildlife habitat management. Concept and applications in forestry. CRC Press (ed.). New York.

Payne, N. F. 1992. Techniques for wildlife habitat management of wetlands. McGraw-Hill bio-logical resource management series. New York. 549 pp.

Shaw, J. H. 1985. Introduction to wildlife management. McGraw-Hill series in forest resources. New York. 316 pp.

Telleria, J. L. 1986. Manual para el censo de los vertebrados terrestres. Editorial Raíces. Madrid. 279 pp.

2. Further reading

Brownie, C., D. R. Anderson, K. P. Burnham, and D. S. Robson. 1985. Statistical inference from band recovery data: a handbook, 2nd ed. U. S. Fish and Wildl. Serv. Res. Publ. 156, Washington, D. C. 305pp.

Burnham, K. P., J. L. Laake, and D. R. Anderson. 1980. Estimation of density from line tran-sect sampling of biological populations. Wildl. Monogr. 72:1-202.

Burnham, K. P., D. R. Anderson, G. C. White, C. Brownie, and K. H. Pollock. 1987. Design and analysis methods for fish survival experiments based on release-recapture. Am. Fish. Soc. Monogr. 5:1-437.

Burnham, K. P. 1993. A theory for combined analysis of ring recovery and recapture data. Pages 199-213 in J.-D. Lebreton and P. M. North, eds. Marked Individuals in the Study of Bird Popula-tion. Birkhauser Verlag, Basel, Switzerland.

Chao, A. 1988. Estimating animal abundance with capture frequency data. J. Wildl. Manage. 52:29 300.

Chao, A. 1989 Estimating population size for sparse data in capture-recapture experiments. Biometrics 45:427-438.

Chao, A., S. M. Lee, and S. L. Jeng.1998. Estimation population size for capture-recapture data when capture probabilities vary by time and individual animal. Biometrics.

Hudson, D. J. 1971. Interval estimation from the likelihood function. J. R. Stat. Soc. B 33:256-262.

Krebs, C. J. 1989. Ecological methodology. Harper and Row, Publ., New York. 654pp.

Laake, J. L., S. T. Buckland, D. R. Anderson, and K. P. Burnham. 1994. DISTANCE User's Guide. Colorado Cooperative Fish & Wildlife Research Unit, Colorado State University, Fort Collins, CO. 84 pp.

Lebreton, J.-D., K.P. Burnham, J. Clobert, and D.R. Anderson. 1992. Modeling survival and testing biological hypotheses using marked animals: case studies and recent advances. Ecol. Monogr. 62:67-118.

Otis, D.L., Burnham, K.P.,White, G.C.,Anderson, D.R. 1978. Statistical inference from cap-tured data on

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closed animal populations. Wildlife Monographs nº 62. The Wildlife Society. 135 pp.

Pollock, K. H., and M. C. Otto. 1983. Robust estimation of population size in closed animal populations from capture-recapture experiments. Biometrics 39:1035-1049.

Pollock, K. H., J. D. Nichols, C. Brownie, and J. E. Hines. 1990. Statistical inference for cap-ture-recapture experiments. Wildl. Monogr. 107. 97pp.

Rexstad, E., and K. Burnham. 1991. User's guide for interactive program CAPTURE. Colorado Coop. Fish and Wildl. Res. Unit, Colorado State University, Fort Collins. 29pp.

Seber, G. A. F. 1982. The estimation of animal abundance and related parameters, 2nd ed. Macmillan, New York, NY.

Wheelan, J. 1993. Wildlife management (apuntes de clase). Dpt. Of Environmental Resource Management. Faculty of Agriculture. Univesity College, Belfield, Dublin.

White, G. C., Anderson, D. R., Burnham, K. P., Otis, D. L. 1982. Capture-recapture and re-moval methods for sampling closed populations. Los Alamos Nat. Lab. Report LA-8787-NERP, Los Alamos, New Mexico. 235pp.

COORDINATION CRITERIA

Joint activities: lectures, seminars, visits ...
Visits organization

SCHEDULE

Period	Assessment activities	Case study	Excursions	Lectures	Comment
1# Week	0.0	0.0	0.0	3.0	
2# Week	0.0	1.5	0.0	1.5	
3# Week	0.0	1.5	0.0	1.5	
4# Week	0.0	1.5	0.0	1.5	
5# Week	0.0	1.5	0.0	1.5	
6# Week	0.0	1.5	0.0	1.5	
7# Week	0.0	0.0	0.0	3.0	
8# Week	0.0	0.0	0.0	3.0	
9# Week	0.0	0.0	0.0	3.0	
10# Week	0.0	0.0	0.0	3.0	
11# Week	0.0	0.0	0.0	3.0	
12# Week	0.0	1.5	0.0	1.5	
13# Week	0.0	0.0	7.0	0.0	Field trip/Outdoor visit
14# Week	2.0	0.0	0.0	0.0	
Total hours:	2.0	9.0	7.0	27.0	

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The methodological strategies and the evaluation system contemplated in this Course Description will be adapted according to the needs presented by students with disabilities and special educational needs in the cases that are required.

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